

PATHWAYS

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The Teaching of History with Children of Primary School Age

by R. M. Evans

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The teaching of history to children of this age range is basically one of communication; the teaching must be geared to the child's powers and ways of thought. Developmental processes must be recognised for the teaching of history, as they have been for some considerable time for the teaching of reading and mathematics. The problem of concept formation in the teaching of history is related to

1. The nature of the language
2. The nature of the subject matter of history
3. The nature of the child.

The Nature of the Language

Abstract terms are frequently used as for example 'the coming of the Moghuls' or the 'Agrarian Revolution'. Many words convey different meanings to different people and this problem is accentuated by the gulf that lies between adults and children. For example the term 'ruler' to a seven-year old may convey a different meaning than to a ten-year old. The interpretation of words by children may depend on a number of factors such as family background, the area in which the child lives, the influence of mass media and not least the level of intelligence of the child. Of course, these factors are not peculiar to the teaching of history.

The Nature of the Subject Matter of History

Two main problems need to be examined here. First, the facts of history are not available for direct observation; so we may have to re-create events by word, drama, modelling or some other media. Second, the use of contemporary language to describe past events can be an obstacle to clear perception. The use of the terms 'house' and 'factory' to describe a building of say 1850, may frequently be thought of by the child as places similar to those he has seen; whereas they are usually totally different types of buildings.

The Nature of the Child

We must be particularly concerned with the child's mental development. Piaget characterises the period between the ages of 7 and 12 years as primarily that of concrete thinking, when the child's thought is confined to the observable qualities of objects. The child's thought is imperfect, unsystematic by adult standards. Nevertheless, the child must be given plenty of practice of thinking at the concrete level before it can move on to the next stage. The concept of time is a particularly difficult concept for children to grasp because.

- * It is an abstraction
- * A child's thinking is egocentric; it is difficult for him to differentiate between past, present and future
- * Some systems of reckoning time are complex as for example in the Christian religion we have the terms B.C. and A.D. Some experimental evidence suggests that the age of eleven is the turning point in the development of the concept of 'historical' time, when the past becomes differentiated into various historical periods.

If these arguments are accepted as valid, then it follows that historical studies should :

- * Start with the familiar and deal with matters which are within the understanding of the children.
- * Start with the visible remains of the past and include the use of as many types of original sources as possible, moving backwards through history.
- * Include opportunities for showing the process of change and development as the first step towards grasping the concept of time.
- * Be detailed in treatment, to suit the nature of the children's thinking, and enable them to form clear mental pictures.
- * Be designed to stimulate mental and practical activity on the part of the children instead of passive looking and listening.
- * Encourage a wide range of methods of investigating, recording and presenting the

material obtained which should include creative work.

- * Conclude with an attempt to interpret the material being studied, in however simple a manner.

The course at Ramjas School, R.K. Puram considered these arguments. The group then studied the main historical feature in the neighbourhood, namely, a Lodhi tomb. This was flanked by a Sikh temple and a South Indian temple. Questions such as the following were discussed.

Who were the Lodhis ? Where did they come from ?

What names did they have ? What food did they eat ? What dances did they perform ? What were their customs and what festivals did they celebrate ?

All these questions could be related to the experiences of the children's own short lives; their food; their customs and festivals.

In addition the tomb was examined much in a 'detective' fashion.

Where did the materials used in the building come from ?

How did the builders construct the tomb ?

What was the width of the walls and the height of the tomb ?

How many people were buried there ?

From a vantage point alongside the tomb, other Lodhi tombs could be observed in addition to other old buildings including the Qutab Minar and some Moghul towers. A simple comparison of domes was made and an exercise in plane-tableing was completed.

All such exercises were new experiences for most of the teachers. An approach along these lines is essential if children are to grasp some of the concepts of history. Sometimes traditional story-telling has to be adopted. There is no one method but a mixture of many if the teaching of history is to be enlivened.

EFFECTIVE LISTENING

Language provides Man with a means of communication, a two-way process involving both the expression and the reception of ideas. 'Language' is an all-inclusive term covering the skills of listening, speaking, reading and writing. Writers write; but unless someone reads what they have written they have not communicated. Likewise speakers speak; but unless some one listens to them, communication does not take place.

Most of our daily communication takes place through the medium of speech. More time is spent in listening - both in and out of school—than in any other facet of language. That is why 'listening' is such a vital aspect of language training. Listening is more than mere reception of sounds; it is the conscious reception of sounds involving the brain as well as the ears. It is not only a language experience but is an experience in thinking as well. One of the important goals of language teaching—especially in the primary years—is the development of the habit of effective listening.

In order to listen, a child must hear the sound stimuli, attend to them, understand the language and have a purpose for listening. There is a big difference between 'hearing' and 'listening'. In order to listen one must first hear. Having heard, the listening then takes place in the brain. It requires an understanding of the code (language) being used. Messages in Morse code are lost on those who are not trained to understand the dots and dashes. We may hear for hours a conversation in a foreign language between two speakers, but do we listen?

Sometimes, of course, hearing defects may prevent children from 'listening'—for example when they cannot distinguish between similar sounding words. Even words that they understand must be spoken in a meaningful context. The story is told of a child who when asked, "If you could be a doctor or an astronaut, which would

you choose?" answered "Bubble Gum". She had heard 'choose' as 'chews'.

The listener's background, his environment, his knowledge of grammar and usage all affect his listening. To a child brought up in Delhi, talk about the sea is not meaningful. Likewise without an understanding of grammar the listener cannot differentiate between 'The boy saw the girl' and 'The girl saw the boy'. The words are the same but the change in their order changes the meaning of the sentence.

Often people listen but do not understand what they hear. If they have no reason for listening, they tend to 'switch off'. Purpose in listening has a direct link with attention. We listen best when we have a reason to do so—especially if what we hear is of interest to us. Conversation at a party tends to get only casual attention, but when the name of a common friend is mentioned the listener is all ears! As teachers we realise that all our words are not equally important; so we provide the students with verbal clues to establish a purpose for listening. Most often these are in the form of strongly emphasised words.

"I'm going to tell you three things that you have to do."

"This is the most important fact in this chapter."

Statements like these alert the listener and give a reason for listening.

Listening, unlike walking or growing hair, doesn't just happen. We cannot take it for granted that because a child has ears he or she can listen. Listening starts in infancy as children learn to differentiate between their mother's voice and the voices of others. They learn to attach meanings to language sounds and other sounds in the environment. By the time they come to school they have in fact, learnt their language through their ears. In school, listening takes on a more

formal and/or a purposeful dimension. Experiences should involve not merely learning to listen, but learning to listen effectively. This ability can be learned and can improve with instruction.

The early exercises in school should attempt to train the ears to discriminate between sounds as they occur in spoken words. This is the basis for matching sounds with the letters they represent. Along with this, training of the auditory memory allows the child to remember sequences in words and meaning sequences in longer passages. Both these help in making the child 'ready for reading.'

RAC TICAL TEACHING SUGGESTIONS

EARLY TRAINING IN AUDITORY DISCRIMINATION

Identification of Different Sounds : "Close your eyes and tell me when you hear the sound of a bell, the tick of a watch, a knock on the door, a tap on the glass . . ." The children can make noises for others to identify. Animal sounds are popular too.

With a tape recorder and a little effort, the group can develop a simple tape library of sounds, which might include street sounds (a car horn, people walking, traffic moving), music sounds, kitchen sounds, animal sounds, school sounds, or any other sounds that strike the children's fancy. There are endless possibilities for vocabulary development to go along with naming and describing these sounds.

Sound Relationships : "Tell your partner if this sound is loud or soft, high or low, near or far, by the window or by the door . . ."

Sounds in Words : "Raise your hand if these words are the same ; don't raise your hand if they are different ; *pat, mat; pat, pat; pat, bat; . . .*". Hearing sounds in words is perhaps the most important of the reading-readiness skills.

Rhyming words : "Can you fill in the last word with a rhyme? "

*I don't know
if it will—*

*Tom and Bill
Climbed up the—*

In this activity, attention can be paid to rhythm patterns as well as to rhyme by leaving multisyllable blanks in the final line of each couplet for the children to complete orally.

*When I looked into the air Listen, children, to
I could see— the news
(a dancing bear) Reema has—*

*(some brand new
shoes)
(a head of hair) (some secret clues)
(a star up there) (it all to lose)
(a rocking chair) (the low-down blues)*

Finding the Word that doesn't belong: "Which word doesn't belong with the others in each group? Why not?"

i) bat	ball	tree	balloon
ii) light	book	right	fight
iii) pig	cow	duck	window

The beauty of this type of activity is that the words can be grouped according to different criteria—beginning sounds, final sounds, rhyme, meaning-association thus providing the children with a thinking as well as an auditory purpose in listening.

AUDITORY MEMORY TRAINING

Reproducing Sound Patterns : The children clap their hands (or tap the table) in response to sound patterns : *tap-tap—tap ; or tap-tap—tap-tap*, for example. There should be a progression from simple to more complex sound patterns. A buzzer is a useful device to conduct this exercise with.

Unrelated Words in Sequence. The children are asked to repeat a series of two, three, four, or more unrelated words in sequence : a series like

Paper, go, red, fast or pretty, walk, girl, green
When the words are related in pattern as in *pretty, bright, red, flower* or *boys, like, candy, apples*, the word sequences are easier to remember. This activity can be used as an effective diagnostic device to determine the children's level of auditory memory. Numbers can be used in place of words.

Following Directions. Simple two-, three-, and four-step directions like

Contd. on p. 17

'The Indus Valley Civilization' — a Reaction

To most of the students in schools, History is "one long battle"—facts and dates to memorise, learning about kings who died thousands of years ago and dozens of bloody wars and bloodless coups. Can't the study of history be made more interesting to children? A positive step was suggested by Mrs Moorthy and Mr. Paul in Pathways (Sept. 1980 in their Unit 'The Indus Valley Civilization'. This is one of the topics in the ninth standard History syllabus. That the method suggested is admirably suited to our ordinary day-to-day classroom teaching, was borne out by the success I achieved. This method, I now firmly believe, can be adopted for a number of other topics at different levels. It does not require additional periods; nor does it cause any disruption in the Time Table. On the other hand, it makes 'knowing History' a pleasure. The general discussions and the students' performance in the test have fully satisfied me that this method can be used effectively, as often as one can find enough materials.

The students were, at the outset, advised to read their text book and study the map. Then the hundred colour slides on the Indus Valley Civilization produced by the Educational Resources centre were borrowed from the EPG and screened. I gave a running commentary with the help of the accompanying booklet and a lot of additional information I had noted down for each slide. At the end of the show, a few questions were asked such as: (i) What must have been the climate of this area then? Give three reasons. (ii) What does the discovery of dice, chess and other games indicate about the people? The answers were not discussed in detail at this stage.

Earlier I had typed out a few copies of the questionnaire given in Pathways. These were pinned up on the bulletin boards in the classroom. I then made a search for relevant books. I used "Ancient cities of the Indus" edited by L. Possehl (Vikas Publications); The Epic of Man by Reader's Digest; Hamlyn's History of the World (which had a beautiful colour picture of an artist's

view of Mohenjo-daro in 2000 B. C.—somewhat like the Pathways drawing); the pamphlet accompanying the slide-tape programme by ERC; Ancient India by NCERT and Romila Thapar; Indian History by Dayal and Barrow; An Outline History of World Civilization by Pearce; Down the Ages by Monica Felton; a pamphlet issued by the Archaeology Dept. and a number of recent newspaper cuttings (one of them was a review of the book "Ancient cities of the Indus", another an article on recent findings, a few on the Indus Script).

These materials were distributed to groups of three or four children. I went round the classroom asking them questions on the pictures. For example, there were two pictures in Possehl's book—one showed the skeletal remains of a human being and the other just an urn. From this it was concluded, of course not too quickly or easily, that they buried or cremated the dead bodies. I also drew their attention to certain interesting pictures and write-ups. A number of students took down points and asked me to clarify materials not understood. As soon as one group finished reading a book or pamphlet, it was passed on to another. In this way in four periods of 35 min. each, all the materials had been looked into by all the groups.

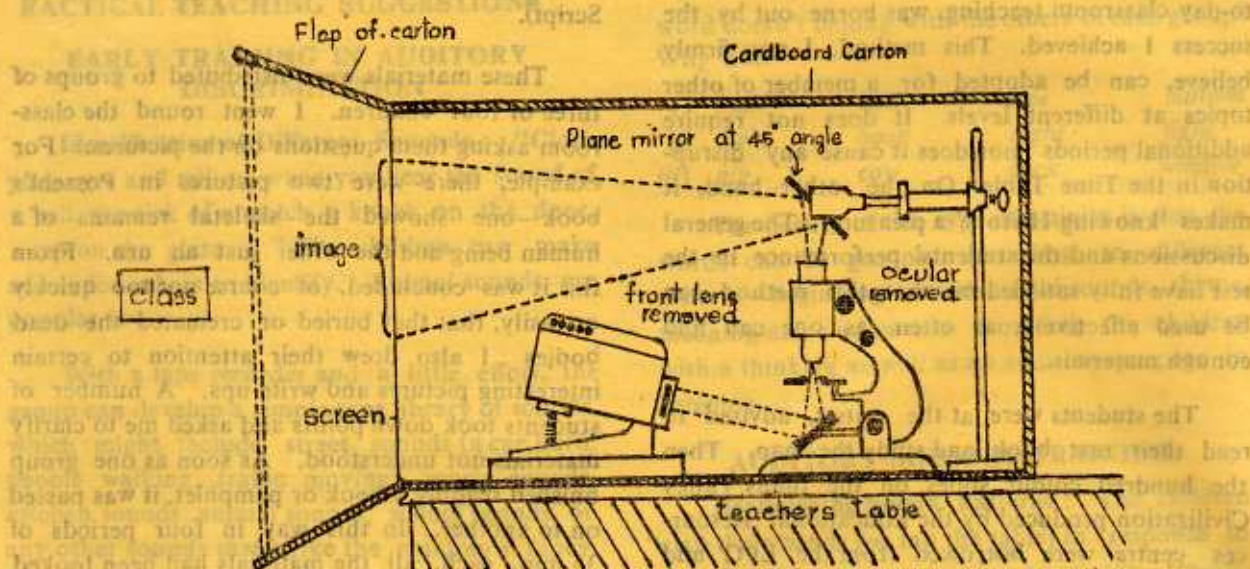
The final step involved systematising the information gathered and drawing conclusions. The questions were all discussed logically and the answers flowed out easily. For almost all the questions, the students were able to provide the correct answers. Not only were all the typed out questions covered but others as well. The kind of survey question answered was "Give examples to prove that the Indus people were technologically advanced". A lot of extra information, not found in the text book, was obtained—the construction of granaries and very interesting facts about the Great Bath and the walls of the houses.

(contd. on p. 23)

AN AID TO OBSERVATION THE CLASSROOM

The following apparatus was described by Mr. R. Lakshminarayanan, District Educational Officer, Coimbatore in an article printed in the Weekly Edition of the HINDU, dated Sunday July 13, 1980. We had requested Mr. Srivastava of Sardar Patel Vidyalaya to try it out before sharing it with our readers. His comments are given after the details of the apparatus.

We feel that it would greatly help teachers in showing prepared slides or living micro-organisms (in water) to a large class at the same time. Apart from time saved (because each student need not peer through the microscope individually), the visual is quite large and the teacher may be able to point out features to the students. We saw a stained slide of a disease-causing bacterium and found it very clear.— Editor.



The eye-piece of the microscope is removed and the rays of light are reflected by a plane mirror fixed at an angle of 45° . A bright source of light is needed, and as suggested in the article, we made use of a slide projector. The projection lens is removed and the beam of light allowed to fall on the mirror of the microscope. The specimen on the slide may thus be projected on a screen or white wall. Mr. Srivastava used a large sheet of butter paper as the screen and fixed it to the front of the box. By this the class can face the projector which will be kept on the teacher's table. Alternatively, the projector may be behind the students and the image projected on to a wall in front of them.

If living micro-organisms are to be viewed, they may be kept in a drop of water placed in a glass slide with a small cavity or hollow in it. This type of slide may be improvised by allowing a blob of molten wax to fall on to a glass slide. When the wax has hardened, it may be scooped out in such a way as to leave a ring within which the water droplet may be contained.

Mr. Srivastava's comments :

- * The cardboard carton or wooden box used must be really large so that the air inside does not get too hot. This is necessary as the projector is kept running for quite some time.

- * Ensure that the fan of the projector stays on throughout. In an attempt to cut down light escaping from the top of the projector, I had used a piece of cardboard immediately above it. This is better avoided as it heats up the projector considerably. If required such a piece of cardboard may be fixed some distance above the projector.
- * The angle of the mirror needs to be carefully adjusted. As there was no room inside my box to place a stand, I used two wires bent into the shape of hooks and pierced through the top of the box.
- * The mirror of the microscope should be well cleaned.
- * The butter paper used as a screen must be tightly stretched so that the image is not distorted.
- * Focussing can be done with the help of the microscope itself.

YOUR ATTENTION PLEASE

PATHWAYS is issued four times a year—in February, April, August and November. The annual subscription for readers in Delhi is Rs. 5/- and for others, Rs. 6/-. Subscriptions may be sent by *Money Order* to the Educational Planning Group, 4 Raj Niwas Marg, Delhi-110054. Each subscription will normally entitle a reader to four issues starting from April of that year to February of the next year. Readers who subscribe after April of any year will be sent the previous issues.

Single copies may be obtained for Rs. 1.25 plus postage. We regret that we are not able to fulfil demands for back issues. We have at present only some copies of the July 1979, February and August 1980 issues available.

Contributions from teachers describing new ideas that they have tried out in their classrooms, their problems and experiences are welcome. These should reach Mrs. Gayatri Moorthy at the above address *not later than the 20th of the preceding month.*

NEW BOOKS

- * **Me and My Word**—An idea Book for Teachers of Environmental Studies in Primary Classes. Published by the *Educational Planning Group*. Second, revised edition due for release shortly.

- * **Food & Nutrition**

- * **Home Management**

Text books of Home Science written by a group of ten experienced teachers, especially for students of Classes XI & XII. A project sponsored by the *Educational Planning Group*.

Available from Arya Publishing House, 30 Naiwala, Karol Bagh, New Delhi-110 005.

- * **Who's who at the Zoo...and Elsewhere**

Teachers Centre, Pusa Road, Springdales School. Contact Mrs. Meera Govil—Tel. 587560. Cyclostyled. 20 pp. Rs. 2.50

A collection of poems, rhymes, stories and comprehension passages devised to evince an interested response from the Middle school English Language pupil. Plenty of opportunity for creative composition around the central theme of animals. Put together by practising teachers to provide varied language work, sufficient for one term.

EXAMINATIONS ARE COMING !!!

The end of a school term is approaching and both students and teachers have to face up to the bogey of examinations. The setting of question papers is a tedious job if it is to be done properly and some of the points listed below might help in this process.

- * Having decided on the syllabus for the examination, do try to distribute the questions over the whole of it. By dividing it into various sections one can decide how important each section is and divide the marks proportionately. Last term's work will carry fewer marks, may be tested with fewer questions; but it should not be totally ignored.
- * By introducing short-answer questions, the number of questions set can be increased. This too helps to cover the syllabus more completely. Essay-type questions, by their very nature, cannot be more than a few in the question paper.
- * Limit the options available to the student. If he has too wide a choice, he tends not to answer questions spread over the whole syllabus. Many students have difficulty in deciding which questions they will tackle best. They lose valuable minutes while making up their minds.
- * When there is a choice between two sections of the same question, they should be of the same order of difficulty, and should test the student in the same way. Both may test him on the recall of facts; both may test him on skill in drawing a diagram, or both may test him in application of his knowledge.
- * Introduce some questions that make a student think. Generally we tend to ask for repetition of work that we have done in class. Explaining how a gadget works or why certain safety precautions are taken is often no test of the student's ability to reason, because the same things have been discussed in class. By all means ask some questions of this type; but include some which are based on similar ideas and yet have not been actually talked about in class.

- * Take care to word your questions very clearly; specify exactly what you wish to know; indicate the length of the answer expected. Simple, unambiguous sentences help the student; he will not have to spend time trying to figure out what you are asking him.
 - * Give clear instructions about different sections of the paper. Are the questions to be answered on the same sheet? Is it to be handed in earlier? Does it have a time limit?
 - * Is your question paper too long? too short? One experienced teacher said to me that she wrote out the entire lot of answers just as she would expect her students to. Having timed herself, she gave the students about three times as much time to answer the test. This made allowances for their having to reason out what they wished to state and to put it down neatly.
 - * Plan your marking scheme immediately after setting the paper. Break down your marks to indicate how many go to each section of a question. If possible, you might even decide what kind of marking is to be done for partially correct or incomplete answers. Putting down marks on the question paper also helps the students. They know where they have gone wrong, can calculate their approximate marks and are saved some anxiety.
- By planning your marking scheme in advance, you also ensure that the different teachers correcting the paper set the same standards and there is reasonable uniformity in marking scripts belonging to different sections of the same class.
- * Before finally handing in your question paper, stop to think. Does an average student, who has been regular in attendance and diligent in his work, have a chance of getting at least 70% of the marks? Even a weak student who tries extra hard should be able to pass. The bright students, generally few in number, will be the ones who score very high marks.

SETTING BEHAVIORAL OBJECTIVES-III

by Jose Paul

In the two previous articles we have defined what a behavioural objective is and recognised that learning experiences take place in three domains—the cognitive, the affective and the psychomotor domains of one's personality. Readers are already aware of the interdependence of these domains—and have tried to spell out behavioural objectives in each of them.

In this article we will concentrate on the cognitive domain; attempt to identify behavioural objectives at the different levels of cognitive learning so as to become aware of changes which we should initiate in our teaching strategies.

There is a succession of stages through which a learner can pass—as shown by the diagram given below. These rungs in the ladder of learning come one after the other. Just as we need to go step by step to climb the ladder, so too, each level of learning can be developed only if the previous level has been developed first. A consideration of the first three steps will make this clear—to 'understand' the learner must first 'know; and to 'apply' he must both 'know' and 'understand'.

EVALUATION

SYNTHESIS

ANALYSIS

APPLICATION

UNDERSTANDING

KNOWLEDGE

Knowledge is what a student is capable of remembering as a result of past learning experiences—terms, facts, concepts, methods, procedures, generalisations, rules, principles. With this knowledge the student will be able to recall, reproduce, define, recognise, identify, label, list, name, outline, state and so on. Behavioural objectives which are restricted to this level of learning might be of this type :

- * The student will be able to describe a plant cell in a paragraph.
- * Given an outline map of India, the student will be able to draw in the major rivers.
- * Given a diagram of a hydraulic press, the student will be able to label the different parts.
- * The student will be able to state Ohm's Law.
- * The student will be able to list the most important causes of World War II.
- * The student will be able to state Pythagoras' Theorem for a right-angled triangle.

The level of mental activity required of the student in the above is limited to repetition of facts and generalisations which have been memorised. There is no doubt that this too is an important factor in the process of learning. Without being able to acquire, store and recall what is learnt, the student cannot progress to the next stage of cognitive development. The ability to recall facts and figures as and when needed will also play a significant role in later life. If the teacher sets his objectives at this level, his duty is only to present the facts, concepts and generalisations in a way that impresses the child's mind strongly; using perhaps lecture, demonstration and audio-visual techniques in the classroom. A judicious study of our examination papers will reveal that nearly ninety percent of the questions set, test the children at this level only. This perhaps means that a major portion of our teaching is also aimed only at this level—the very first step in the ladder of learning.

Understanding or Comprehension is the second stage in the hierarchy of mental activity, the next step on the ladder. Comprehension is defined as the ability to grasp the meaning of the material. A child who has understood the material will be able to translate, condense, change into

symbols, draw diagrams, correct mistakes, give examples to illustrate, summarize, expand and so on. Behavioural objectives at this level might be of this type :

- * The student will be able to write in his own words, five important reasons for the start of World War II.
- * The student will be able to summarize a given passage into one-third of its size.
- * The student will be able to translate the written mathematical problem into a symbolic mathematical sentence (equation).
- * Given a set of changes, the student will be able to observe them and separate them into physical and chemical changes.
- * Having learnt the concept of a metre, the student will be able to estimate a given distance, of say 5 metres, within an error of 5%.

Now something more than mere recall is demanded of the student. He needs an in-depth grasp of the material before he can express the generalisation in a different form. To give another example, a student may be able to recall and state the Laws of Reflection of Light without understanding what is meant by the terms used—viz. 'angle of incidence', 'angle of reflection'.

When a teacher sets his objectives at this second level of learning, he needs to provide the student with a variety of learning experiences in order to ensure that a given concept is fully understood. A teacher may point to a book and say, "This is a red book." Unless a number of other 'red' objects are pointed out and the concept strengthened, there is a risk that to a very young child 'red' may come to mean the name of the object rather than its colour. Further re-inforcement of this concept may come from comparing the 'red' and 'not-red' objects. Learning of this and other concepts, takes place at the level of understanding. We appreciate this even better as we teach higher concepts like inertia, osmosis surface tension and so on. Still higher up in the school, abstract concepts like moral, democratic,

spiritual and aesthetic values and attitudes are sought to be inculcated in the students. Generalisations and principles, which are the relationships between concepts are still more difficult. Children need to be given several opportunities and helped to discover these on their own. This means active involvement of the child in the learning experience.

Let us take a few examples. To understand that the sum of the angles of a triangle is equal to two right angles, the child should be encouraged to measure the angles in a number of triangles and note down the sum of them. Finding out by himself is better than just being told the fact by his teacher.

Likewise, if a child is given a pendulum, allowed to experiment, collect data and infer the relationship between the length of the pendulum and its time period; the learning becomes more meaningful.

To be told that the human pulse rate is 72 to 80 beats per minute means less than being able to actually count the pulse of a number of classmates, find the range and also the average pulse rate.

Application is the ability to use the knowledge acquired; to find similarities between new problems and situations and those studied in the classroom. It may mean the application of concepts and principles to new situations; the application of laws and theories to practical problems; the solving of mathematical problems or the construction of graphs, charts and diagrams. Other behavioural words at this level are change, compute, discover, predict, operate, demonstrate, manipulate, modify and so on. Objectives may become somewhat more elaborate :

- * Having learnt the principle of expansion of solids due to heat, the student will be able to point out the application of this principle in at least three unfamiliar situations.
- * Having learnt the principles involved in changing direct speech into reported speech, the

child is capable of converting an unseen passage into direct speech and vice versa.

- * Having learnt to interpret the road map of Delhi, the student will be able to use the road map of any city to locate places, to calculate distances from one place to another.
- * Having learnt to interview people, the student is able to conduct a survey in his neighbourhood and collect specific information about them.
- * Having learnt the concept of percentages, the student is able to calculate commissions, discounts, sales tax and so on in simple problems.
- * Having learnt the procedures of conducting group discussions in a democratic way, the student is able to organise and effectively conduct a small group discussion, giving freedom of opportunity and opinion at everyone present.

We often believe that we are teaching at this level and feel satisfied that our examination paper contains a question like

"Give the scientific principle which explains why"

How often have we asked for explanations which we have already discussed in class? Have we given the child both familiar and unfamiliar situations in the question, and allowed him to discover similarities, apply his knowledge and find the answer? Learning at the level of application is essential for the understanding of higher concepts and generalisations. Further development in any subject will depend on applying facts and understandings of a lower level in various new situations.

Here I would like to mention a personal experience. At a workshop where a number of teachers were present—including graduates in Science—I gave them two identical-looking medicine bottles and a spring balance. They were asked to weigh the empty bottles; fill one with water and the other with oil and then re-weigh them. Intense argument followed. The bottle of oil

weighed less than the bottle of water! This could not be correct . . . perhaps the spring balance was faulty. We tried to compare them on a common balance borrowed from the grocer. Again the same result was obtained. After much discussion—the scientific reason for this result was arrived at; and it led one Science teacher to exclaim, "My God! For years I've been teaching this fact to my senior students using Specific Gravity bottles and Chemical balances in the laboratory!"

As the same incident has happened more than once, one can only conclude that many of us do not *apply* our knowledge to common, familiar situations. We remain confined to text-book knowledge.

Analysis is the process of breaking down complex materials learnt in order to understand their complexity better. This breaking down into component parts gives rise to a deeper understanding of the organisation and structure of the material. As a result of analytical ability, the student is able to identify facts, locate relationships between facts, recognise unstated or implied assumptions, recognise principles involved, point out fallacies in reasoning, distinguish between facts and inferences and so on. Verbs like separate, subdivide, select, break down, draw diagrams, differentiate, distinguish, identify and infer are among those which might be used to spell out behavioural objectives at this level. Here are some samples:

- * Having read the novel, the student will be able to identify the character traits of a given personality and write a short character sketch not exceeding three pages.
- * Having read the article "Achievements of the Government during the years 1973-74", the student will be able to differentiate the facts from inferences.
- * Given a collection of statistical data the student will be able to present them in the form of a graph, interpret it and draw some inferences from it.
- * Having found a fault in the electrical system of a radio, the student will be able to locate the defective part by testing each part of the system in turn.

We often teach students at this level when we give them mathematical problems or problems in social sciences. However the teacher must guard against the temptation of giving the students the solutions. It is easy to do this and then give them other similar problems. By doing so we deprive them of a much needed exercise in thinking, out for themselves. Unless the student develops with minor of finding the habit of analytical thinking, similar problems presented in a slightly different way or variations may become difficult. A child taught to use a formula to calculate simple interest must be able to use it in all its forms to find any of the four factors as required.

Provoking a child to react analytically has far-reaching consequences in other areas as well. The teacher is actually teaching him to THINK, to delve deeply into the material, to probe, to want to find out.

Synthesis means the putting together of various parts of knowledge to form a new and unique whole. The work of an imaginative man, an inventor, a poet, a writer or any other form of creative activity involves synthesis. They use their knowledge, experiment with various items, put it together in a different way to produce something new. Behaviours at this level might include the devising of a programme of operations, the production of any form of creative work, writing a poem, composing music, speeches, stories; planning and carrying out experiments to solve problems and so on. Objectives written for this level might be of this type :

- * The student will be able to draw the plan of a kitchen, keeping in mind the wise utilisation of space, the convenience of the housewife, and the need for adequate ventilation.
- * The student will be able to make an original design for textile printing keeping in mind a suitable colour combination, the material on which the design is to be printed, the type of use of the material and the printing facilities available.

- * The student will be able to devise new toys or working models based on easily available local materials, which will help a primary school child to develop muscular co-ordination.
- * The student will be able to organise a picnic or excursion trip for his class taking into account various factors like the numbers involved, the availability of transport, financial resources and so on.

At this level, children are being allowed to express themselves freely. Tremendous patience on the part of the teacher is essential, as any attempt to tell the student what to do may cause him to 'switch off' and return to routine work. This explains why an exercise in Creative Writing requires that the teacher should, at first, provoke and encourage a free flow of ideas and ignore errors in spelling and grammar. We need to be careful not to let the children develop feelings of inadequacy or inferiority. So many children who enter our schools full of curiosity, imagination and creativity leave as stereotyped persons, cast into one mould. Constant encouragement from the teacher should lead the children towards awareness of their own potential, self-confidence and individuality.

Evaluation, the highest form of intellectual activity, involves judging. Almost all decision-making in life depends upon our ability to judge situations in correct perspective; to judge the value of any material; to evaluate the worth of what we are going to do. Evaluating any material means judging its intrinsic value as well as its extrinsic value—that is, its value in relation to its purpose. A patriotic song may be well-sung and melodious (intrinsic value), but we also need to find out if it serves to inspire people—the purpose for which it was written. The process of evaluation contains elements of knowledge, understanding, application, analysis, synthesis along with conscious judgement based on clearly defined criteria. Some behaviours to be expected at this level could be :

- * The student is able to write a critical appreciation of a given poem.

(contd. on p. 15)

GEOGRAPHY CAN BE FUN

by Freddy Pimenta, S.J.

"The goal in teaching is to promote spontaneous development while acting as an adult guide. To guide does not mean to give completely worked out answers"—Piaget.

Many geography teachers find it quite a problem to make the learning of geography an exciting and interesting experience. Though they use such techniques as journey method, the story method, the project method, the regional method... and such teaching devices as filmstrips, slides, maps, globes, models, pictures... something fails to click in the mind of the learner because these secondhand experiences are not integrated with the firsthand experiences of the child. Some teachers resort to the age old question-answer method. Parents who take up the children's lessons at home also prefer ready-made answers which solve their own problems, but make the study of geography quite boring to the pupil. And yet, geography can be fun. The various teaching techniques and teaching devices can make the subject interesting and meaningful to the pupil but only if they are related to and integrated with the pupil's direct experiences in his own environment. Then learning becomes a personal experience of discovery, not an impersonal one of learning mere facts that are unrelated to his own special world.

For the teacher who is prepared to meet the challenge of education by seeking the more effective rather than the more convenient methods of education, the following statements will provide a basis on which to plan teaching strategies.

- * The child is very interested in his environment.
- * Observation is the primary way of increasing knowledge of the world.
- * Related observations are progressively linked together to give greater understanding.
- * Children have the need and desire to communicate the results of their observations and the ideas which develop from them.

- * Free discussions (both with children and with adults) aid understanding and provide a further stimulus for further enquiry.
- * Second-hand information is of greatest value when it can be integrated with recently acquired or recently considered first-hand experiences.
- * The most effective learning is obtained when children's investigations are aided, rather than directed by the teacher.

Some practical suggestions based on the above statements follow :

1. Let the children observe the marvellous world around them.

Children scarcely need to be encouraged to do so: our educational system rather dampens their enthusiasm in this respect. An issue of the NIE Journal relates the incident of the teacher in a school of Nigeria who was thoroughly annoyed at one of her pupils who was staring out of the window at a bunch of bananas hanging on a banana tree instead of concentrating on the picture of the banana the teacher was holding up for the benefit of the children. In this connection I recall the unit on deciduous trees discussed with the students of standard IX. The students told me what they had learnt in the previous classes from text books...broad leaves...they shed their leaves in autumn...the season occurring between September 22 and December 21. When they were asked whether any of them had seen such trees, a little more than half the class said that they had seen such trees, some in Darjeeling, others in Matheran, others in Victoria Gardens. None of them had even noticed the deciduous tree in the school compound. Not even students of the keep-the-school-clean group who assiduously used to pick up the brown leaves that floated gently into the classroom on a windy day. The tree in question used to shed its leaves not during the autumn season but after December, during our cool, dry season.

Not only was there a deciduous tree on the school grounds, but in the garden overlooking the entrance gates stood a 'Christmas tree' so typical of the coniferous region. The pupils observed and compared these two trees noting that the 'Christmas tree' was shorter...the leaves were green all the year...very narrow (T: these trees don't lose much moisture)...that's why they are evergreen...the tree is triangular in shape...the deciduous tree was taller...branches spread out...broad leaves...tree loses moisture that's why the leaves dry and fall off during the dry season the deciduous tree provides more shade and shelter than the other tree...(this year the leaves of the deciduous tree are drying and falling off earlier than usual...poor monsoon rains?)

2. Let the children discuss and express in the classroom.

Why must learning be associated with a funereal silence and why should the effectiveness of the teacher be gauged by the degree of silence and passivity he instills in the children? Silence obtained by dictating notes or by a long winded, unnecessary narration of facts, is not educative. Here is an example of how a part of the unit on monsoon rains was discussed with pupils of Standard VIII.

Teacher walks into class and begins by posing a problem.

"One of the walls of this building is coated with tar. I wonder why?"

Pupils' reaction...silence for a few minutes, then a gentle murmur...the sound of enthusiastic children sharing their opinions...still no solution...then one boy requests permission to leave the classroom and dashes back with a few small scrapings...of tar..."The wall facing south is coated with tar".

Teacher: Why only that wall?

That wall gets wet during the rainy season no, it gets damp...the paint on the inner side of the wall peels off...the Librarian has to remove the pictures hanging on that wall. The Librarian has

one of the class boys help him in the task. Tar is waterproof. It is used on the roof to prevent leaks...rain strikes that wall.....

Teacher: In what direction?

Must be the south west...there is the south west monsoon...it starts raining in June...till about August or September. the kite season starts by the end of September...whenever it rains heavily we get a holiday.....But teacher, why isn't the wall of the building in front also coated with tar?.....

Teacher does not answer that one, another boy does that. It is made of stone, and so there the wall does not get damp. So there is no need to coat that wall with tar. After this free expression of opinions the teacher puts up an outline map of India and invites one of the students to indicate by means of arrows the direction of the South-west monsoons. One of the pupils comes to the blackboard and draws the arrows from land to sea. No reaction from pupils.....no attempt to correct the direction of the south west monsoon winds.

So the teacher enquires: Have you ever been to Nariman Point or to Marine Drive during the rainy season?

"Teacher, I stay there".

Have you ever noticed the clouds? Dark clouds coming towards me... I am facing the sea. The arrows are in the wrong direction.....The correction is made: from sea to land. After all this exchange of opinion the teacher helps the pupils to organise and summarise their experience and reactions.

1) The South-west monsoon winds blow from sea to land from June to September. (2) the winds bring along clouds that are dark grey in colour. (3) These clouds are rain bearing clouds.

After this the pupils were ready to learn more about the monsoon winds that influence other lands like China, East Africa, Central Africa, Australia and after this, the causes of the monsoon were discussed.

(contd. on p. 15)

(contd. from p. 12)

- * The student is able to prepare a comparative study of the philosophies of two given religions.
- * The student is able to evaluate a given political speech, point out fallacies in the arguments, differentiate facts and truths from inferences or suggestive statements.
- * After visiting a museum, the student is able to identify three paintings he liked and explain why he liked them.

Teaching children at this level implies giving them ample opportunity to make responsible decisions in their day-to-day activities, decisions for which they are answerable. To develop critical evaluation, the teacher while bringing the facts to the forefront has to present them in a strictly unbiased fashion; he has to avoid imposing his own values and judgements on the students. So often children follow the lead given by adults or by a majority, without using their own minds to think. Obviously teaching evaluative thinking means that the teacher subtly guides and leads the children into building their own individual personalities. Tough as it is, this should be the ultimate goal of every teacher.

A NEW CATECHISM

Who is the pupil ?
A child of God, not a tool of the state.
Who is the teacher ?
A guide not a guard.
Who is the faculty ?
A community of scholars, not a union of mechanics.
Who is a principal ?
A master of teaching-not a master of teachers.
What is learning ?
A journey not a destination.
What is discovery ?
Questioning the answers, not answering the questions.
What is the process ?
Discovering ideas, not covering content.
What is the goal ?
Open minds not closed issues.
What is the test ?
Being and becoming, not remembering and reviewing.
What is a school ?
Whatever we choose to make it.

Allan A. Glatthorn

(contd. from p. 14)

3. Children should be encouraged to record their observation in their own style.

This style may be considered unsuitable from the purist adult point of view, but one should remember that a child is a child, not a miniature adult. Style develops along with the personality of the child. Let the children discuss their recorded observations.....let them listen to the observations made by their fellow students. This process will have an influence that is more educative than the teacher's own impeccable blackboard summary. Perhaps the summary could be cyclostyled and sent to the parents of the pupils.

So, geography can be fun and educative too. We might try to cease treating our pupils like empty suitcases just waiting to be stuffed with piles of knowledge sometimes of dubious quality and more often than not of dubious utility. Guide the children to discover the wonders of their environment, to love and appreciate the world around them. This process of discovery might certainly be time-consuming but time is not a vital factor in the entire process of education. Maturity cannot and should not be forced upon children. As Piaget rightly remarks. "This seeming loss of time is necessary for real discovery ; what a child does by himself may take longer at the time, but while he is experimenting, he is learning a method " There is an elementary rule in science that says that in any experiment one factor at a time is varied while other factors are kept the same. In most schools children are taught this rule at fourteen, but if a child is allowed to experiment he may understand the same at twelve.

From an article in 'The School Teacher'
December 1972 Issue

We do a lot more TALKING,
Children do a lot more LISTENING,
Than is good for either of us.

Distillation by Solar Heat

(Children are reading in newspapers and magazines about the use of solar energy. Mrs. Meera Parasnis, who has written for us before, gives details of an experiment which students can try out on their own. We suggest you ask them how this apparatus works, although an explanation is given at the end—Editor.)

Materials : Large rectangular (biscuit) tin, black paint (waterproof), salt, water, glass pane, collecting dish,

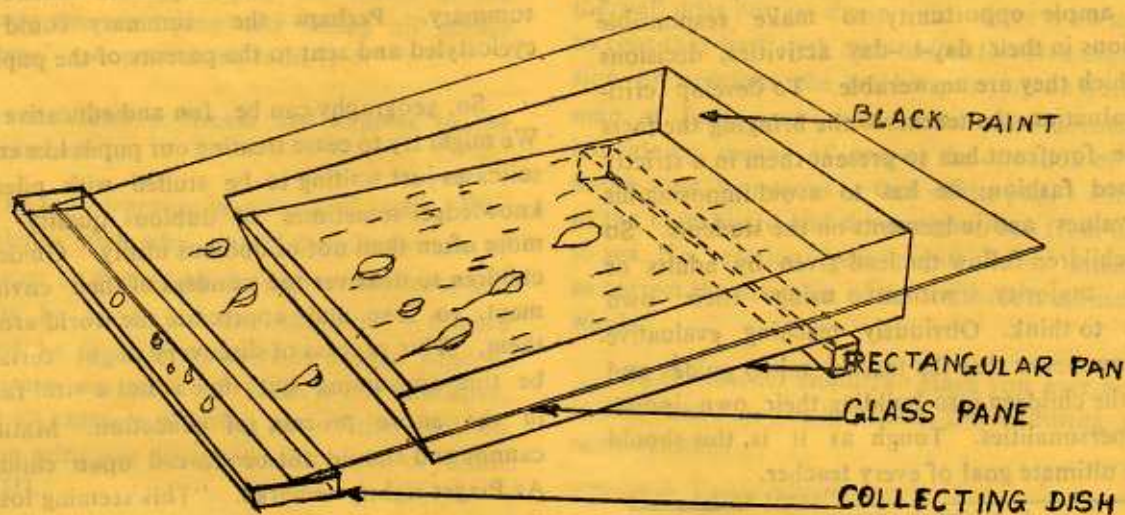
Take a large rectangular tin. Cut two edges of one small side about a centimetre deep. Bend the part inwards between the two cuts on to the end of the tin. This edge is now lower than the opposite edge.

Paint the inside of the tin with waterproof black paint. Allow the paint to dry completely.

Place some bricks' blocks under the uncut end so as to incline the tin. Let the whole thing face the sun.

Put about 2 cm of salt water in the tin. Cover the salt water with a glass pane which is long enough to extend beyond the lower end of the tin.

Place a dish close to the lower end of the glass.



SOLAR WATER STILL

Your distiller is ready (Figure).

Let the sun shine over the distiller for a few hours.

What do you see ?

The drops of distillate form on the glass and eventually slide to the lower side and fall into the collecting dish.

Taste the water in the tin and in the dish.

What is the difference ?

The water in the tin is salty and water in the dish is not.

Why ?

You have distilled water by solar heat.

The solar energy is absorbed by the blackened surface of the tin and changed into heat. This heats the water in the tin which vaporises. The vapour condenses on the cold surface of the glass pane. The glass pane being inclined, gravity pulls the distilled droplets and they finally collect into the dish.

Meera A. Parasnis

(contd. from p. 4)

"Stand up. Raise your right hand. Close your eyes. Open them again. Walk to the door. Turn around. Go to the bookcase. Pick up the red pencil on top of the bookcase. Return to your chair." can be used to develop a skill essential to latter school activity. Working in pairs, the children can give directions for one another to follow.

Rhyming Descriptions. The children listen and draw pictures in response to a story told by the group leader. For example, "A funny clown ran around town, with a big red hat shaped like a bat. He had a green nose that looked like a hose"

Games. Auditory memory training can be developed through games like these :

Restaurant : From a menu of pictures, the children "give orders to the waiter" who must remember and "serve" the food.

Grandfather's Suitcase : The children recall and repeat a sequence of items, as in :

"Grandfather packed his suitcase and put in socks".

"Grandfather packed his suitcase and put in socks and shoes".

"Grandfather packed his suitcase and put in socks, shoes and shirts".

"Grandfather packed his suitcase and put in socks, shoes, shirts and ..."

A number of variations of this game are already popular amongst Indian children.

In school, as in life, children find themselves in situations that require listening and they need to learn to adjust their listening according to the demands of the situation. For example listening to directions on how to conduct a science experiment or how to play a game differs from listening to music for relaxation after lunch, or listening to a debate. The classroom must provide a variety of experiences with the spoken word.

Listening may take place at four levels. *Simple listening*-a step above hearing-involves little concentration. There is a passive, marginal in-

take of ideas, as for example among a group of children chatting on the playground. *Attentive listening* means a conscious effort to understand and remember what is being said-that is, it is listening to learn. This happens when someone makes an announcement, gives directions or explains facts. It is an important skill for day-to-day use in school. Have we not often caught ourselves saying, "Now pay attention please"? Since situations that demand attentive listening arise in the classroom all day long, this type of listening can be a continuous focus of language instruction. Specific practice in attentive listening can be provided through activities such as the following.

Sounds around You : Children live in a world of sound. Attentive listening allows them to tune in to the sounds around them. A sound lesson might be introduced by reading a passage like the one below :

Wherever I go I hear different sounds—loud sounds and quiet sounds, long sounds and short sounds, high sounds and low sounds, harsh sounds and musical sounds. I hear squeaks and creaks and bangs and clangs; jingles and jangles and pitters and patters, tootles and twattles and rattles and clatters, boos and moos and cock-a-doodle-doo.

The children are asked to close their eyes for a minute or two and listen carefully to the sounds they hear around them—footsteps in the hall, feet shuffling at the back of the room, the whirring fan children on the playground, traffic outside the school. Then depending on the age and ability of the group, they write or dictate with the help of a scribe, the sounds they hear, words that can be used to describe the sounds and how the sounds make them feel—happy or sad, fierce or frightened, cuddly or distant. "Sounds around You" can be extended beyond school sounds to include sounds of home, sounds of the neighbourhood, sounds of the woods, and the like.

Sound Stories : "Sound stories" can be part of story time in the early grades. The children listen for key words in a story and add appropriate "sound effects" when they hear the key words.

For example :

Once there was an angry king (g-r-r-r) who used to ride on a white horse (clip-clop). He had a beautiful wife (-m-m-m-m), a happy son ha, ha, ha,) and a pretty daughter (ah-h-h-h). One day, the angry king (gr-r-r) and his happy son (ha, ha, ha,) went hunting (bang, bang) As they rode along on the big white horse (clip-clop) they saw a giant (gulp) who was . .

Spoonerisms : A spoonerism is a slip of the tongue that usually involves the transposition of initial sounds in words, as when we say "the queer dean" instead of the "dear queen". In spoonerisms we "wix our mords". The children can create spoonerisms from their own names—Seepak Dingh (Deepak Singh), Mita Gurthy (Gita Murthy)—as part of auditory awareness of initial sounds. As the group leader reads a story with built-in spoonerisms the children listen attentively to identify them and suggest what the words really should be. For example :

"On Halloween, I got Poppilops, gewing chum, bandy cars, dumgroops, abananas and bapples, belly jeans, bopcorn palls, pakes and kies and noughduts."

The children can have fun making up spoonerisms for toys or for foods they like (or don't like), names of cars, television shows or other familiar things or experiences.

Gossip : The first child in a line or a circle whispers a "secret" to a second child, who whispers it to the third who whispers to a fourth and so on. The last child compares what he or she heard with what the originator of the "secret" said. It's amazing how distorted a message can get! An appropriate follow-up to this type of activity is a discussion on how accounts of happenings can be distorted as they are told by one person after another.

I'm Thinking of a Word : The children listen attentively to word clues that are given by the leader (teacher or pupil). For example :

I'm thinking of a word for the things you put on your feet when it's raining.

I'm thinking of a word for white, fluffy masses that float through the sky.

In this type of activity, necessary attention is paid to vocabulary. Clues can be adapted to the children's grade level and background.

Story Summaries : A leader provides a one- or two-sentence summary of a familiar story which the children then identify. For example : "Elves came to help a poor old man and a poor old woman." or "A boy climbs a tall beanstalk and gets chased by a giant." This also requires the listening/thinking skill of main idea and has a direct tie-in with literature, written language and storytelling.

Listening to Classify : As a list of words is read, the children listen attentively to classify the words into categories. Different criteria can be used for classification; initial sounds, rhyme; vowel sounds; descriptive qualities (classifying animals that have fur, skin or feathers); functional qualities (classifying objects as furniture, clothing or toys); common suffixes (-ed, -ing, -er); number of syllables in each word; accent patterns. Whatever the basis for classification, the aim is to have the children listen attentively as they hear the words on the list.

Following Directions : A functional and frequent classroom activity, following directions demands attentive listening too. Specific practice in following directions can be provided with exercises like this :

Draw one-inch margins at the right and left-hand sides of your paper. Write the date in the lower left-hand corner. Above the date write your name and your grade. Skip three lines from the top and draw a two-inch square in the middle of the paper. Draw a circle one inch in diameter, touching the middle of the bottom line of the square.

The directions are given one at a time. The teacher can make them as simple or as complex as the children can handle. They might be given to the children in order, increasing in complexity and length from one child to another. For example :

*Ram take the chalk and put it on my desk.
Hari take the chalk from my desk, tap on the window with it and return, it to the chalk tray.
Gita do all the things you just saw Hari do and then pick up the chalk and draw a large, happy face on the blackboard.*

A third level of listening is *appreciative listening*, where the primary emphasis is on the sounds or words and not on the content; it involves the emotions and feelings. Opportunities for appreciative listening in the classroom are provided mostly through music, poetry and stories.

Singing : Singing a few songs each day (perhaps to start off the morning or to conclude the afternoon) brings a dimension of life and beauty to the children's daily school schedules. The use of simple rhythm instruments engages the children more actively in the listening process. As a follow-up to singing or listening to familiar songs, the children can create new verses.

Art and Movement: As they listen to musical selections without words the children can draw or paint to recreate the images and moods that the music stimulates within them, or activities involving creative movement can be planned.

Music as a stimulus for creative thinking and writing : As children listen to music, they can be asked to think about how it makes them feel; where it makes them think they are (on top of a mountain, at the bottom of the ocean, on a busy city street); and what they see happening in their minds as it plays. Story-telling and creative writing are natural follow-ups to this type of activity.

Just to Enjoy : Not all music must be used for responsive or participatory purposes. There should be occasions when the children listen to tapes and records for enjoyment and relaxation

during free time, after recess, after lunch, and at other times during the school week.

The Rhythm of Language : Children are fascinated with the rhythm and sounds of language. There is rhythm in all spoken words, and there's no better place to start than with the rhythm in the sounds of the children's own names. For example, the group can compare the staccato rhythm of *Ram Singh* with the longer, softer pattern of *Mekhala Sengupta*. And listen to the melodic patterns in names from children's stories *Rikki-Tikki-Tavi*, *Ali Baba*, *Rumpelstiltskin*, *Rapunzel*. The emphasis here is on awareness and appreciation of impressions created through the rhythm of language.

Poetry is Precious : Poetry is written to be read aloud, so it should be presented through the medium of oral language and enjoyed through listening. With poetry, opportunities for appreciative listening abound. A good anthology of poetry for children is an essential classroom tool with not only poems written for children, but poems written by children as well. Children should be exposed to poetry daily or at least weekly.

Two cautionary comments in making poetry part of appreciative listening :

A. Not all children should be expected to appreciate every poem that the teacher chooses to share. Tastes differ and appreciation can't be forced.

B. Poetry is designed to be enjoyed, and enjoyment can be killed through dissection.

While analysis of poetry as a part of literary criticism may be appropriate in the upper grades, the elementary school years should be a time for a pleasant introduction to poetry and for enjoyment of it.

Storytelling : Like poetry, storytelling is a form of literature that is rooted in the oral language tradition and thus lends itself to appreciative listening experiences. Going "beyond the

writing structure to the imagery behind it" is the essential dimension in appreciative listening. Appreciative listening involves listening for words that the storyteller uses to convey sensory impressions, to heighten suspense, to develop a plot and to make the characters come alive in the ears and minds and eyes of the listener. It involves singling out image-making words and figures of speech and seeking out the sounds and rhythmic qualities that influence the moods of a story. As children share and retell stories to one another, the focus can be on action words, picture words, funny words, alliteration, repetition, or any other language device that the skilled author or storyteller uses.

Critical-Creative listening is the highest level of listening where the brain is engaged in thinking, even as we listen. This might take place when we try to comprehend the trend of ideas in a speaker, to anticipate what he might say next, to sort out the main points from irrelevant details, to sort out fact from opinion and so on.

The four levels of listening are obviously not mutually exclusive. Listening to background music while reading a book may be on a low level, but listening in order to learn and understand the words calls for attentive and appreciative listening. An awareness on the part of the teacher, helps in planning language lessons.

Talking and listening go hand in hand or at least they should. Since listening is an integral part of every activity involving spoken language in the classroom, suggestions for helping the children develop their critical-creative listening/thinking skills are presented here within the context of appropriate oral language activities. Here, listening is made a conscious and directed part of the experience.

Show and Tell : The children bring common objects from home (an ice-cream cup, an ashtray, a bookend) and describe one of them without showing it. On the basis of the description the group guesses what the object is. **FOCUS :** listening for details

Sharing : This is similar to Show and Tell,

but the children don't have to describe an object. Instead, they tell the rest of the group about an event or an experience of importance to them. On the basis of what they hear or the questions they ask, the group determines why the experience was important to each "sharer". In the upper grades the same activity can be done with pupils' choices of books, movies or TV shows. **FOCUS :** listening for conclusions and cause-effect relationships.

Storytelling : As a child tells a story or recounts an experience, the audience listens specifically for the order of events given. **FOCUS :** listening for sequence.

As a child retells a story he or she has heard or read (in a sense giving an oral book report), the audience listens to identify the climax of the story or the way in which story conflicts are resolved. **FOCUS :** listening to identify plot elements in a story.

A leader tells a familiar fairy tale with a few new twists (*"Little Blue Riding Hood walks across the sand dunes carrying buns in a plastic bag to Grandmother's flat"*) and the other children count the errors they hear. **FOCUS :** listening for details.

Discussion : A child repeats, in his or her own words, the idea stated by the previous speaker and then makes additional comments by way of agreement or disagreement. For example: *"I agree with you that we should have lower speed limits because it saves gas, but I think a more important reason is that there are fewer accidents on the highway."* **FOCUS :** listening for cause-effect relationships.

Oral Reports : A pupil reports on an item in a local newspaper, and the others listen to determine the specific subject of the article. **FOCUS :** listening for main idea.

As a pupil presents a report on a curriculum-related topic (the Nagas, for example), the group listens for specific information that will help them learn more about the topic (the Naga culture,

accounts of Naga family life, food and the like).
FOCUS: listening for details.

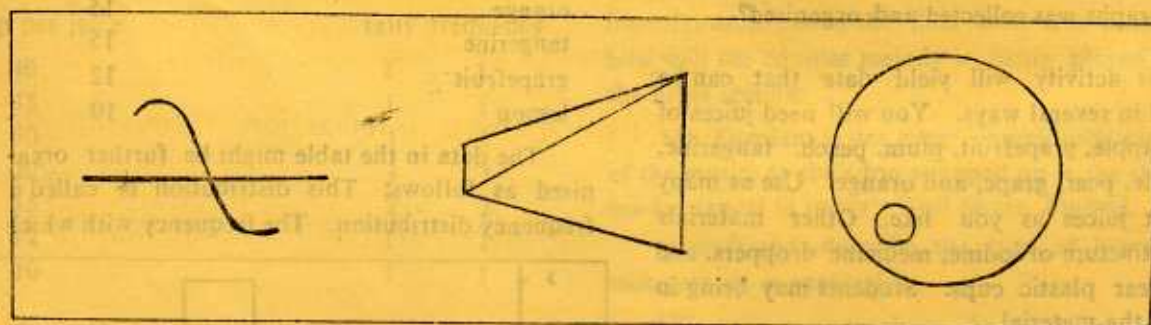
A child who is presenting an oral report prepares a "blank outline" form for the others to fill in as they listen to the report. This assumes that the child has carefully outlined the report before presenting it. FOCUS: listening for organisation.

Interviews: After conducting and tape-recording interviews with parents, teachers or other children, the group listens to the tapes to identify key words that the interviewers used or to distinguish between the important and the unimportant parts of the interviews. FOCUS: listening to determine relevant details or point of view.

Vocabulary Development: A leader reads a list of words for example: *mob, clan, crowd, handsome, troupe, posse, cigar, gang*, and the other children listen to discover which words don't belong in the list. FOCUS: Listening for details.

Along with other oral language activities, opportunities for developing the children's listening/thinking skills at this level are almost limitless. Many of the exercises typically found in reading comprehension programmes can be adapted to speech for listening practice. A number of these exercises might be taped by some children (great oral reading practice!) for use by other pupils who need help with listening.

Television is by now a way of life in our



Giving Directions: To gain practice in clarity and preciseness of language, a leader gives directions (how to fold a piece of paper to make a hand puppet, where to find a pencil hidden somewhere in the room, how to conduct a science experiment, how to follow a map,) and the rest of the group listens to complete the task. This activity has the advantage of an immediately observable response. FOCUS: listening for sequence.

The children prepare cards with small geometric designs (as part of a math project perhaps). Some examples are shown in the figure on this page. They give directions to one another on how to draw these designs. If the directions are clear, the designs will match. FOCUS: listening for details and sequence.

larger cities. Televiewing offers simultaneous input of information through both the eyes and the ears. Children need to acquire a variety of listening skills to assimilate the content of the programmes. Teachers could perhaps have classroom discussions of both television and radio programmes which interest the children. They provide opportunities for children to practise listening skills in a meaningful and functional context.

Today's children live in a cacophonous world, bombarded all day long by noises in the environment. They often find refuge in a state of non-listening. Classroom experiences should be designed to overcome this lethargy and help them to listen effectively.

(concluded on p. 23)

Simple Statistics

The activity described in this article will introduce students to the fundamental statistical concepts for organising and displaying data. Students will also gain insight into the application of elementary statistical analysis.

Discussion with the class can bring out examples of situations where statistics are used. Students might think of opinion surveys, government reports, business marketing studies, the physical sciences and other examples.

Show several types of graphs to the class (circle, line, bar graph, and pictograph). Let different students interpret them. Can anyone give an explanation of how the information shown on the graphs was collected and organised?

This activity will yield data that can be graphed in several ways. You will need juices of lemon, apple, grapefruit, plum, peach, tangerine, pineapple, pear, grape, and orange. Use as many different juices as you like. Other materials include tincture of iodine, medicine droppers, and small clear plastic cups. Students may bring in some of the material.

Different amounts of vitamins are present in the juices you will be testing, hence a different amount (in drops) of each juice will affect the colour change in the iodine. Put equal amounts of iodine in the plastic cups. Distribute medicine droppers to use with the juices. Do not dip the medicine droppers in the iodine.

When Vitamin C is added to iodine, the iodine changes from its coloured form into a colourless liquid. The students should add each of the juices to the iodine until a colour change is seen. Have them record the number of drops of each juice added.

Suppose you have obtained the following data: lemon juice, 10 drops; tangerine, 15 drops; orange, 15 drops; apple, 20 drops; pineapple, 30 drops; peach, 20 drops; pear, 20 drops; plum, 35 drops; grape 40 drops; and grapefruit, 12

drops. The data may be arranged in numerical order, the lowest to highest or vice versa. It is conventional to arrange measurements of this kind from highest to lowest. This form of organisation is known as a normal distribution. (See Figure 1).

Figure 1.

Normal Distribution	
Name of juice	number of drops
grape	40
plum	35
pineapple	30
pear	20
peach	20
apple	20
orange	15
tangerine	15
grapefruit	12
lemon	10

The data in the table might be further organised as follows: This distribution is called a frequency distribution. The frequency with which

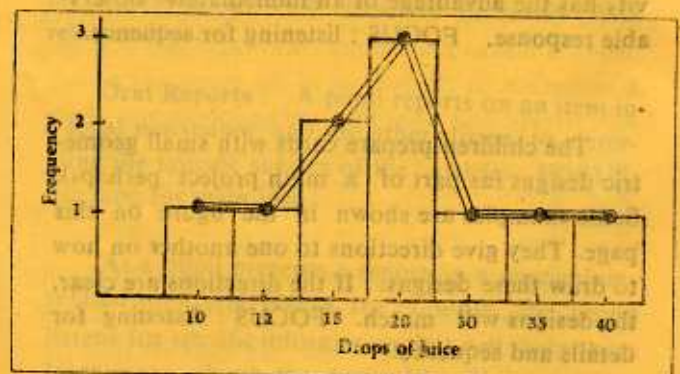
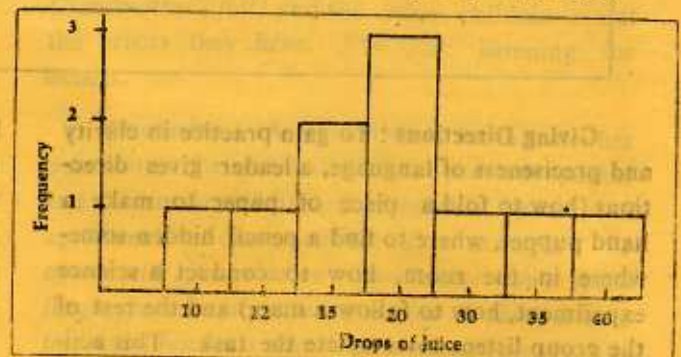


Fig. 3.

each measurement occurs is noted. The information is more meaningful; the original raw data can be treated graphically. Also, students will observe a tendency for the data to cluster in the middle and trail off at the two extremes.

Depending upon the purpose for which the data is to be used, scientists may be interested in dispersion or scattering of data (also called central tendencies). One measure of dispersion is range. The range is the difference between the lowest number and the greatest. Let students calculate the range for the extremes of their data. In our example, the range is $40 - 10 = 30$.

Figure 2.

Frequency Distribution

drop per juice	tally	frequency
40	1	1
35	1	1
30	1	1
20	3	3
15	2	2
12	1	1
10	1	1

A graph is a visual way of organising data. One common graph used in statistics is the histogram. The histogram graph would appear as in Figure 3. Another kind of graph that can be made is a frequency polygon. The frequency polygon graph is made by connecting the mid-points of the top of each bar in the histogram.

The number of measurements which occurs the most often is called the mode. If a sample has two measures that occur with the same frequency then the distribution is said to be bimodal.

Many other activities could be used to demonstrate the application and presentation of statistical data. Students could conduct an opinion poll and display the results graphically.

[Reprinted from 'THE HINDU' dated August 3, 1980]

(contd. from p. 21)

An Exercise for Readers :

The scene is the waiting-room of a dentist's office. Five patients are sitting there and music is being piped in.

Mr. Applebee is marginally attending to the music as he thumbs through a six-month-old issue of Sports Illustrated.

Ms. Barnaby is humming the tune quietly to herself trying to recall the words and the name of the song.

Mrs. Catapult is relaxing, using the music as a tranquiliser to take her mind off the sound of the dentist's drill coming from the next room and off the ordeal she dreads.

Mr. Doodle, a concert violist, is listening intently, anticipating the flute solo and judging how well the counter melody is being played by the brass section.

Ms. Eggplant is not even consciously aware of the music, as she's too wrapped up in the stock market report in today's Wall Street Journal.

Identify and describe the type of listening each person is engaged in.

[We cannot, as teachers, hope to promote effective listening in children unless we become effective listeners ourselves.]

(Adapted from 'Effective Communication' by John F. Savage. Published by Science Research Associates Inc. Chicago).

(contd. from p. 5)

I found it exciting to work in this manner. The students seemed interested on the whole. They have definitely developed a greater interest in books other than the text and there were demands for more such books. A number of them brought relevant newspaper cuttings on other topics and also interesting information and even personal photographs of themselves taken near ancient monuments. About this lesson particularly one observation I made was that most of them felt proud of being Indian.

Chitra Subrahmaniam
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